in every way in carrying on his difficult task. At the time of Balfour's death it was already building a spacious laboratory and private rooms adjoining it to accommodate students of zoology. Owing to the rearrangement of the M.B. examination, further increase soon became necessary, and this the University provided in 1884 by bodily lifting the roof off the Mineralogical Museum and building up walls under it.

Whilst Prof. Newton kept alive in the University the study of zoology as a study of living animals, Sedgwick promoted the interest of those more interested in the architecture or morphology of the animal body. He had become in 1880 a Fellow, and soon after lecturer at Trinity College, and the college (as is the habit of Cambridge colleges) allowed his University lectures to count as though they were delivered to, as they were paid for by, the college.

Sedgwick's first researches, as was natural, were on embryology, and were mainly concerned with the origin of the vertebrate kidney. He also published a short paper on Chiton, with two useful diagrams, but the work by which he will be longest remembered was his investigation into the embryology and anatomy of the Cape species of Peripatus. His investigations did much to clear up the nature of the body-cavity of the Arthropods, and to explain what had become of the cœlom in the members of this group. What he found in the developing egg of Peripatus started him on more than one interesting speculation. His views on the cell-theory, at one time much criticised, have largely come into their own. Another of his ingenious hypotheses largely based on the same research related to the origin of segmentation in metameric animals. At one time he had contemplated a final volume to his "Zoology," which was to deal with the theory and philosophy of the science, and it is very greatly to be regretted that this has not appeared. His originality of outlook and power of expression would have made it a valuable contribution to the more speculative side of zoology.

As a result of his work on Peripatus, he was elected a Fellow of the Royal Society in 1886, and he twice served on the council of that body. In 1897 he became tutor at Trinity College, and for ten years held that position. Although he continued with his usual vigour the teaching and management of a great department, this appointment practically coincided with his ceasing research. It also coincided with the production of what is undoubtedly the most comprehensive text-book in English written, with the exception of one or two groups, by one man. Sedgwick's aim in his great text-book was to mention practically every genus. Of course, in some groups, such as the insects, this ambition could not be realised; but his broad outlook, his wide knowledge, and, on certain lines, his philosophical insight have made the book invaluable to all advanced students of the subject. It will be, with his work on Peripatus, a lasting memorial to his name.

In 1907 Prof. Newton died, and the chair of zoology then passed to Adam Sedgwick, who for so many years had been the head of the department of morphology. To the great regret of his Cambridge friends he only held it for two years. In 1909 he accepted the post of professor of zoology at the Imperial College of Science and Technology, and for the last three and a half years he spent his whole energies in the attempt to build up a school of zoology in South Kensington.

For some months his friends had marked with dismay a serious decline in his health, but his sudden death on February 27 came as a shock to many who read of it in their morning paper last Friday.

If one may say a few words about his personality, he was extraordinarily "alive," very trenchant in his criticisms, not a good lecturer, the reverse of fluent, yet by his earnestness and by the vigour of his language arresting attention. Still he was a successful teacher. The best course he gave was that on embryology; here he was giving his class the results of first-hand, personal knowledge, and his students felt they were listening to a master of the subject. His very entrance into the great laboratory where some hundred students were being taught by eight or ten demonstrators put a new spirit into the thing. The atmosphere, as it were, became electrified, and teachers and taught were "keyed up." As a conversationalist he was most interesting, holding often bizarre and impossible views, and maintaining them with extraordinary energy and humour. If one may judge by portraits and statues, he was in physique very like his great-uncle—small and frail in body, his face was quick and keen. Like his great-uncle again, he was an eager and rapid worker, one who never spared himself when working at the subject to which he devoted his life.

NOTES.

The following fifteen candidates have been selected by the council of the Royal Society to be recommended for election into the society:—Prof. V. H. Blackman, professor of plant physiology and pathology at the Imperial College of Science and Technology; Dr. William Bulloch, professor of bacteriology in the University of London; Mr. D. L. Chapman, fellow and tutor of Jesus College, Oxford; Prof. W. E. Dalby, professor of civil and mechanical engineering at the Imperial College of Science and Technology; Dr. T. R. Elliott, lecturer in practical medicine at University College Hospital Medical School; Prof. J. C. Fields, professor of mathematics in Toronto University; Dr. J. S. Flett, assistant director of the Geological Survey of Scotland; Prof. J. P. Hill, Jodrell professor of zoology and comparative anatomy at University College, London; Mr. A. R. Hinks, chief assistant at the Cambridge University Observatory; Prof. F. Keeble, professor of botany in University College, Reading; Prof. A. Keith, Hunterian professor of the Royal College of Surgeons; Dr. K. Lucas, lecturer in natural sciences, Trinity College, Cambridge; Prof. O. W. Richardson, professor of physics in Princeton University; Dr. W. Rosenhain, superintendent of the metallurgical department of the

National Physical Laboratory; Mr. G. W. Walker, formerly superintendent of the Eskdalemuir Observatory.

The Secretary of State for India in Council notifies that one appointment to the Indian Geological Survey Department will be made in July next. A further vacancy is expected to occur in the year 1914.

The Rome correspondent of *The Times* states that the Italian Geographical Society proposes to give a gold medal to Capt. Scott's family and two silver medals respectively to the families of Dr. Wilson and Capt. Oates.

The death is announced, in his eighty-fifth year, of Dr. S. A. Lattimore, professor of chemistry at the University of Rochester, N.Y., from 1867 to 1908. As a young man he spent ten years as a classical tutor and then professor of Greek at his *alma mater*, a university in Indiana. Having then decided to adopt a scientific career, he became professor of chemistry at Genesee College, where he served for seven years before his appointment at Rochester.

The death is announced, at the age of ninety-one, of Major-General Henry Clerk, R.A., F.R.S. General Clerk was elected a fellow of the Royal Society so long ago as 1848, and he served on the council in the years 1878–80. He was the author of papers on meteorological and magnetic observations made in a voyage to the Antarctic circle, and also of papers on the strength of timber, friction, and the flow of liquids through small orifices.

For the meeting of the British Association which will take place in Birmingham on September 10–17 next, the following sectional presidents have been appointed:—A (Mathematics and Physics), Dr. H. F. Baker, F.R.S.; B (Chemistry), Prof. W. P. Wynne, F.R.S.; C (Geology), Prof. E. J. Garwood; D (Zoology), Dr. H. F. Gadow, F.R.S.; E (Geography), Prof. H. N. Dickson; F (Economics), Rev. P. H. Wicksteed; G (Engineering), Mr. J. A. F. Aspinall; H (Anthropology), Sir Richard Temple, Bart.; I (Physiology), Prof. F. Gowland Hopkins, F.R.S.; K (Botany), Miss Ethel Sargant; L (Education), Principal E. H. Griffiths, F.R.S.; M (Agriculture), Prof. T. B. Wood.

Mr. R. J. Balston, of Maidstone, has presented to the British Museum (Natural History) his well-known collection of humming-birds. The birds are mounted and arranged in forty-nine cases, each of which contains a group of two or more species. The total number of specimens in the collection is stated in Mr. Balston's MS. to be 3315, representing 162 genera and 480 species. Of these, 2674 are skins, and 199 nests, some of the latter containing eggs. As soon as arrangements are made for its reception the series will be placed on exhibition in one of the corridors on the first floor of the zoological department. This collection and the Gould collection will render the exhibited series of humming-birds one of the finest, if not actually the finest, in the world.

The thirty-fifth annual general meeting of the Institute of Chemistry was held on Monday, March 3. Prof. R. Meldola, F.R.S., occupied the chair, and in the course of his presidential address he remarked that the applications of chemistry in every field of human activity have been steadily increasing, and the importance of professional chemists to the public welfare is becoming more and more recognised. Professional chemists have not secured that full measure of public recognition to which they are entitled, but in this country all scientific affairs move but slowly. The consolidation and the elevation of the profession and the maintenance of the status of the chemical practitioner will become more and more determined in the future by the standard of efficiency and of conduct set up by the fellows and associates. Until the whole level of public appreciation of the value of this profession is raised, the country is destined to lose the services of that highest type of cultured and trained chemist of which other nations are more wisely availing themselves, to our detriment and their advantage.

The following are among the lecture arrangements at the Royal Institution, after Easter:—Dr. A. S. Woodward, two lectures on recent discoveries of early man. Prof. W. Bateson, two lectures on the heredity of sex and some cognate problems. Prof. W. Stirling, three lectures on recent physiological inquiries. Prof. T. B. Wood, three lectures on recent advances in the production and utilisation of wheat in England. Dr. E. Frankland Armstrong, two lectures on (1) the bridge into life; (2) colour in flowers. Prof. J. Garstang, three lectures on the progress of Hittite studies. Prof. W. J. Pope, three lectures on recent chemical advances. Mr. H. A. Humphrey, two lectures on Humphrey internal-combustion pumps. Prof. E. Rutherford, three lectures on radio-activity. The Friday evening meetings will be resumed on April 4, when Mr. J. J. Dobbie will deliver a discourse on the spectroscope in organic chemistry. Succeeding discourses will probably be given by Mr. C. J. P. Cave, Dr. T. M. Lowry, Prof. J. Garstang, and Mr. H. G. Plimmer.

As has been pointed out already in these columns, March 19 will be the centenary of the birth of David Livingstone. The event is being and will be commemorated in a variety of ways. On February 27 the University and town of Cambridge held a meeting at the Senate House, when speeches on Livingstone's work were delivered. Livingstone College, Leyton, E., has published, as a souvenir of the centenary, an illustrated brochure, entitled "Memorials of David Livingstone"; it contains two portraits of the explorer in colour and other pictures and extracts connected with his work. Livingstone College was founded in the year 1893, in order to give instruction to foreign missionaries in the elements of medicine and surgery, and constitutes a permanent memorial to Dr. Livingstone in the neighbourhood of London. It is now appealing for a sum of 10,000*l.* in order to meet various needs, one of which is to clear off a mortgage of 3500*l.*; 1500*l.* is needed for making certain improvements, whilst it is desired to raise 5000*l.* as the nucleus of an endowment.

An eighteenth-century picture, which is said to be a portrait of Gilbert White of Selborne, has lately come to light. Referring to this discovery, Mr. Wilfred Mark Webb remarked, at a meeting of the Selborne Society on March 3, that it was believed that no portrait of Gilbert White existed or had ever been painted. There was, he said, a reason for believing this, in view of the fact that Gilbert White was marked with smallpox, and would probably therefore not wish his appearance to be recorded. Still, the picture, which had been found in the Caledonian Market, and had come into the possession of a relative of one of the members of the society, showed internal evidence suggesting its possible authenticity. The stretcher, canvas, and frame indicated the date, about 1770, when Gilbert White was fifty years of age, and the portrait fitted that age. It also had a family likeness to the portraits of John White and Thomas White. There was a tablet on the picture stating it to be a portrait of Gilbert White, but this had been added when the painting was twenty years old. It was intended if possible to trace the history of the picture, but this would be difficult, though it had once come into a sale-room in London and had been withdrawn. Mr. Webb preferred to await investigation before expressing an opinion.

IN the course of a lecture on heredity in feeble-mindedness, delivered at the Galton Laboratory, University College, London, on March 4, Dr. David Heron showed a long series of pedigrees to illustrate various phases of mental defect, and said that there can be no doubt that it is a hereditary character. When, however, attempts are made to discover precise laws of inheritance, many difficulties are encountered, due to the fact that the term "mental defect" covers a multitude of conditions, each of which exists in an almost infinite number of grades of severity. Dr. Heron severely criticised some recent attempts to apply Mendelism to such cases, and showed that the evidence cited told strongly against the theory. What is specially required at the present time is more information. Special efforts ought to be made to follow up the children who are passing through the special schools for the mentally defective, and also to trace back the school histories of those who are now mentally defective criminals and paupers. Much yet remains to be discovered regarding the inheritance of mental defect, but on the basis of our present knowledge it may be asserted that a substantial reduction in the numbers of the mentally defective could be obtained by cutting off the supply at the source—by preventing the feeble-minded from reproducing their kind.

FEBRUARY was generally mild and dry, the rainfall in parts of England being less than one-half of the average. At Greenwich the mean temperature for the month was 41°, which is nearly 2° above the average, but is 2° colder than in February last year. There were during the month ten nights with frost in the shade, whilst on the grass open to the sky there were twenty-one frosts at Greenwich, and on the three consecutive nights from February 22 to 24, the exposed thermometer fell below 20°. The mean of the highest day readings was 47°, and the mean of the lowest night shade readings 35°. The duration of bright sunshine at Greenwich was fifty-eight hours, which is five hours more than the average for the last thirty years. The aggregate rainfall for the month was 0·80 in., which is 0·69 in. less than the average of the last sixty years, and at Kew Observatory the total rainfall was only 0·73 in., which is 0·86 in. less than the normal, and only 0·09 in. of rain fell in the last nineteen days of the month. At Greenwich the mean temperature for the three winter months was 42·5°, which is the same as the mean for the winter of 1911–12, but warmer than in any of the eight previous winters. The rainfall for the winter was about an inch in excess of the average, and February was the only dry month of the three.

THE alpine flora of Japan is to be made the object of special investigation by the Tokyo College of Science, which is establishing a large botanical garden for the purpose at Nikko, situated in a region of high mountains. The Tokyo *Asahi* of January 24 devotes considerable space to an account of the new enterprise, which is intended as a complement to the two gardens, representing the temperate zone and the tropics respectively, laid out by the college some years ago elsewhere in Japan. The site for the new garden was acquired some four or five years ago, and the necessary adaptations and arrangements are expected to be completed early in the summer of the present year. The buildings erected in the enclosure comprise a laboratory, a residential building for students, experimental greenhouses, &c. The garden is to be divided into eighteen sections for the separate cultivation of all varieties of mountainous flora, ranging from trees and shrubs to ground-plants and lichens, and including foreign as well as local growths. Dr. H. Komatsu has been placed in charge of the new station, to which the large collection of alpine species already acquired by the college, but hitherto restricted through lack of accommodation, will be transferred in due course.

BY the death of Mr. George Harold Drew at the age of thirty, which occurred suddenly at Plymouth on January 30, a worker of great promise has been lost to science. Intending in the first instance to qualify for the medical profession, Mr. Drew studied for this purpose at Cambridge, where he was a scholar of Christ's College, and subsequently at St. Mary's Hospital, London. He, however, never completed his medical course, and devoted himself to biological and pathological research, in which he displayed exceptional aptitude. After working for a short time at the Port Erin Laboratory, he settled at Plymouth, where, at the Marine Biological Laboratory, the greater part of his research work was done. For three years he held a Beit memorial fellowship, and he was last summer appointed John Lucas Walker research student in the University of Cambridge. He made two journeys to the United States and the West Indies for the purpose of carrying out researches in connection with the Carnegie Institution. On the purely scientific side, Mr. Drew's best work was on the development of Lamminaria and on the physiological action of marine bacteria, more particularly on denitrifying bacteria and their power of precipitating calcium carbonate. His pathological work was all undertaken with reference to the problem of cancer. He commenced by a study of the effect of transplanting tissues in invertebrates, and subsequently extended his researches to fishes, where he investigated the effect of repeated stimulation of the tissue by chemical reagents. During the short time he held the John Lucas Walker studentship he was engaged, with much success, in the culture of tissues from the frog and the dogfish in plasma outside the body of the animal.

A paper read recently before the Royal Statistical Society by Prof. E. C. K. Gonner, on the population of England in the eighteenth century, was of interest both historically and geographically. In the first part an analysis, in considerable detail, was furnished of the sources available for estimating the population before the "unfortunate superstition which delayed the taking of a census" was removed from the public mind, and of the controversy which occupied the pens of contemporary investigators. By means which he fully set forth, the author then arrived at conclusions which justified him in presenting comparative maps of the density of population in England in 1700, 1750, and 1801, which, while greatly generalised and based only on county areas, show several features of the highest interest. To take one case, the early establishment of a dense population in Lancashire, contrasted with its later establishment in the midland industrial area, and still later in the West Riding of Yorkshire, forms a series of facts which clearly emerges on the maps. Throughout the period there is visible the tendency of the present industrial areas to take their places above the purely agricultural areas in the list of relative density of population, although the population of the agricultural areas by no means declined. The results so accurately parallel the history of these areas at the period that the author's conclusions and his use of authorities are clearly justified.

No. 17 of the sixtieth volume of Smithsonian Miscellaneous Collections is devoted to notes by Mr. A. H. Clark on the American species of Peripatus, with a list of the known New World representatives of the group.

The Agricultural Department of India has issued a further instalment, in its Memoirs, of the life-histories of Indian insects; this contribution, which is by Mr. G. R. Dutt, dealing with parasitic and other Hymenoptera. In the case of some of the Mutillids, or "velvet ants," it has not yet been ascertained how many species they may affect parasitically, and as this may have an important economic bearing inquiries are to be set on foot with the object of filling this gap in our knowledge.

In an interesting and fully illustrated report of an expedition to Arctic America, published in the January issue of *The American Museum Journal,* Mr. R. M. Anderson states that the musk-ox was exterminated by Eskimo in the neighbourhood of Franklin Bay about fourteen years ago, and that the species is also practically killed off in the district around the east end of Great Bear Lake. The barren-ground caribou and the white sheep have likewise suffered severely at the hands of natives armed with modern weapons, although small numbers of the latter are still to be found near the sources of every river from the Colville to the Mackenzie, which probably formed the limit of its range.

Messrs. J. G. O'Donoghue and P. R. H. St. John have published in *The Victorian Naturalist* (January, 1913) some notes on the vegetation and bird-life of the Brisbane Range, in continuation of their earlier work on the natural history of this little-known Australian locality. The prevalence of the gum-tree saw-fly in this area may be judged from their mention of a sapling of *Eucalyptus rostrata* which actually drooped with the burden of five large masses of the larvæ of this insect. Among other items of these interesting notes, mention may be made of the extraordinary activity of small red ants in the transport of the seeds of acacias, evidently for the sake of the oily appendage (caruncle), which the ants bite from the seed, leaving the latter in great masses outside the nest. Brief references are made to the various types of vegetation associated with different soils and physiographic aspects, but it is greatly to be hoped that Victorian botanists will make a detailed ecological investigation of what appears to be an area of unusual interest from this point of view.

Prof. F. W. Oliver has contributed to *The Gardeners' Chronicle* (No. 1364, February 15) an extremely interesting account of the new nature reserve at Blakeney, Norfolk. The extensive area of waste maritime lands known as Blakeney Point, which has been presented to the National Trust, is to be preserved as a place for the study of wild nature, its acquisition having been made primarily on scientific grounds rather than on account of its scenic or historic interest, though it is fully entitled to rank as a place of great natural beauty. As Prof. Oliver has shown in his recent article in *The New Phytologist,* Blakeney Point shows to perfection the operation of the sorting mechanism by which new ground is built up from the spoils won by the sea from the land, and brought back by an orderly process in the form of shingle, sand, and mud, and also the colonisation of this new ground by plants appropriate to its kind. The distinctive features at Blakeney are the profusion in which developmental stages of all the maritime plant-communities abound, and the rapidity with which change in each sort of terrain is being accomplished. Apart from its ecological interest, the Point is famous as a breeding ground for wild seafowl, and as a place of call for winter migrants, while in many and various respects the fauna generally is full of interest, especially with reference to the important and sometimes surprising relation of the insects and the rabbits to the plant population.

The liability to drought in India as compared with that in other countries is the subject of an interesting paper by Dr. G. T. Walker in the Memoirs of the Indian Meteorological Department (vol. xxi., part v.). The paper is a preliminary attempt to deal with the matter from an examination of the annual records, owing to want of details for some countries. A tabular statement gives for a number of stations for which long series of observations were available the normal rainfall and the percentage of years with deficiency (1) between 30 and 45 per cent., (2) between 45 and 60 per cent., and (3) more than 60 per cent. In India places on the coast usually fare better than those in the interior; but burning sun and hot-dry winds during a long break in the rains do much more harm than in some other countries. In the United States, *e.g.* a deficiency of rain produces nothing like the damage that it does in India, while in Europe the liability to failure in the crops is not in the least comparable with that of India. In South America, Brazil and the Argentine Republic show nothing worse than a few cases of deficiency between 30 and 45 per cent., but in Chile, Santiago shows a considerable number of cases of deficiency in the three classes above mentioned; in some parts of Chile there may be a year without any rain whatever.

The January number of the American journal *Good Lighting* contains an article by Prof. Gotch, of Oxford, which gives a valuable summary of our present knowledge of the properties of the eye when used for detecting and observing distant coloured lights, such as are seen at sea. The normal eye under such conditions recognises a red light as red over an area of the retina the radius of which is three or four times that over which a green light is recognised as green. Outside this area the red light is not seen at all, while the green light outside its area of recognition is seen as a bright white light. In view of these facts, Prof. Gotch suggests that in the absence of binoculars, on which in practice the recognition of the colour of a distant light depends, it should be noted whether the light, apart from its colour, is seen better by oblique than by direct vision; if so, it is a green or white light. If it is seen better by direct than by oblique vision it is red.

Red Book No. 176 of the British Fire Prevention Committee deals with tests made on a new celluloid substitute, intended to reduce the risks of fire from the use of kinematograph films. The material was "Cellit," which is an acetyl-cellulose, manufactured by the Bayer Company, Ltd., and resembles celluloid in all respects except that it is far less inflammable and appears to be practically free from the dangers which attend the use of celluloid. As the result of stringent tests to which it was subjected, the material was awarded the committee's certificate of "non-flaming." A copy of the report can be obtained from the secretary of the committee, 8 Waterloo Place, Pall Mall, S.W.

The Engineer for February 28 contains an account of an automatic electric light plant manufactured by Messrs. R. A. Lister and Co., Ltd., of Dursley, Gloucestershire. This plant is intended for private house installations, and consists of a petrol engine, dynamo, automatic starting switch, and water tank, the whole being mounted on two cross girders providing facility for setting down and removal. A small battery is supplied, of capacity very much below that of our ordinary private electric lighting plant. When the battery is charged and no lights on, the engine is at rest. If lights are switched on in number below that capable of being dealt with by the normal discharge of the battery, the engine remains at rest until the battery voltage drops to a certain value. On this voltage being reached, current is automatically sent through the dynamo, and runs it as a motor, thus starting the engine, an operation facilitated by the exhaust valve being automatically held open. When the battery is sufficiently charged, the engine stops again. The engine will also start and keep running if the demand is higher than that which can be dealt with by the battery alone. Exhaustage of the battery by reason of failure of the engine to start when required is prevented by a time-limit circuit-breaker, which allows starting current to pass through the dynamo for a limited period only. The whole arrangement seems likely to minimise the troubles which occur in small lighting sets owing to improper handling of the batteries.

The issue for 1912 of the "Year-Book of the Scientific and Learned Societies of Great Britain and Ireland" has now been published by Messrs. Charles Griffin and Co., Ltd. It is described on the title-page as a record, compiled from official sources, of the work done in science, literature, and art during the session 1911–12, and in consequence its appearance is a little belated, and the information provided about some associations rather behind the times. But the present is the twenty-ninth issue of a work of reference which has proved its utility to workers in science and literature; its welcome would be even greater if it could be published in October, when the academic and scientific sessions begin.

OUR ASTRONOMICAL COLUMN.

Discovery of a Comet 1912*d*.—From *The Times* of February 26, we learn that a faint comet was discovered by Mr. B. Lowe, at Laura, South Australia, on December 31, 1912. According to the report by Mr. Dodwell, director of the Adelaide Observatory, the object was visible in a small telescope, and was seen to have a short tail; its position on December 30, at 5.30 p.m. (G.M.T.), was about 4° south of Spica, and it was travelling southwards so rapidly that the position on January 5 was about $\alpha = 14^{h}. 30^{m}.$, $\delta = 29^{\circ} 50' S.$ An approximate orbit gives February 3 as the time of perihelion passage, when the comet was probably some sixty million miles from the sun, and indicates that the least distance from the earth occurred about the time the object was discovered, and was about twenty-five million miles. Mr. Dodwell also states that Mr. Lowe anticipated Mr. Gale in the discovery of comet 1910*a*, but did not notify the fact until later.

An Interesting Occultation.—On March 13 an interesting occultation will be provided by the moon passing in front of the Pleiades. As new moon occurs on March 8, our satellite will, at the time of the occultation, present a fairly thin crescent, and the several stars of the group will disappear at various points on the dark limb, to reappear at the bright limb. The first bright star to disappear will be Electra (mag. = 3·8), which will enter near the southern horn at 10h. 1m. p.m. Then will follow Merope